

BEST VALUE TASK ORDER PROPOSAL
Date: 12 AUGUST 2003
Project Number: DAHA06-03-Q-0016
Project Title: SHORELINE STABILIZATION, CAMP ROWLAND
Project Description: SHORELINE STABILIZATION, CAMP ROWLAND, NIAHTIC, CT
Performance Period: 180 Calendar Days
Assessable Liquidated Damages: \$255 Per Day
Offer is due not later than 2:00 PM on: 19 SEPTEMBER 2003 -BID BONDS NOT REQUIRED
You may fax your offer to: (860) 524-4874 or e-mail to: diana.marini@ct.ngb.army.mil
Site Visit: 1:30 PM, AUGUST 22, CAMP ROWLAND, SMITH STREET, NIAHTIC, CT

CONTRACTOR'S OFFER
Offer is:
Acknowledged Amendments
For (Company Name)
Contract Number
By: Typed Name
Signature
Date:

Scope of Work

12 AUG 2003

Construction

Shoreline Stabilization at Camp Rowland, Niantic, CT

DAHA06-03-Q-0016

Introduction/History:

This Scope of Work is to construct the stabilization of 700 total linear feet of shoreline on the Niantic River at Camp Rowland.

The Connecticut Army National Guard (CTARNG) is required to maintain its coastal resources to the best extent practicable in accordance with State of Connecticut coastal consistency requirements. The stabilization of shoreline bank is in accordance with the CTARNG Integrated Natural Resources Management Plan as required by the Sikes Act (16 USC 670a et seq.).

In small sections totaling approximately 275 linear feet, asphalt was placed as a stabilization attempt and now needs to be removed. In addition to the asphalt area, approximately 150 feet of the toe of the shoreline bank is eroded and needs to be stabilized with a low retaining wall. Soil in these areas is to be planted with beachgrass. A staircase located at the southern extent of the project limits, needs to be removed and replaced.

The construction of this project requires the obtaining of two permits, Flood Management Certification and Coastal Consistency Review. These permits will be applied for and obtained by the Environmental Division of the FMO once the design has been completed.

Please note that this is the construction portion of a Design/Build project involving complete engineering oversight by an outside contractor. Some factors may result in modifications during construction based on field condition changes. The Project Engineer overseeing the construction of this project will dictate changes with final approval of the CTARNG. Changes are not expected to be significant, however, the contractor should be aware that small changes will most likely occur.

Site Location:

The primary objective of the work to be performed under this scope is the construction of shoreline stabilization of approximately 1500 linear feet of eroded bank on the Niantic River at Camp Rowland. Camp Rowland is located in Niantic and provides a garrison training environment and quarters to support the Army and Air National Guard units.

Camp Rowland is located between 14 and 16 feet above mean sea level, close to the Long Island Sound. It lies adjacent to a widened segment and near the mouth of the Niantic River. A narrow unvegetated beach exists with slopes of between 15° and 26°. These slopes are vegetated. The uplands (top of bank) are flat, developed areas with buildings, roads, and fields. On-site soils are Merrimac and Hinckley, consisting of somewhat disturbed soils with a high hydraulic conductivity. These soils are highly erosive and are prone to slumping.

Major Requirements:

In order for the Contractor to accomplish the work under this delivery order, it shall be necessary for the Contractor, as an Independent Contractor, and not as an agent of the CTARNG to complete the following tasks at Camp Rowland:

Task 1. Slope Stabilization

Unstable slopes border the Niantic River, but they have foliage – brush, weeds and a few trees. These plants and trees appear to be well-rooted and stable. All areas of the banks that are vegetated are to be left untouched.

Bituminous “fill” failed to stabilize these slopes; this fill is to be replaced with topsoil texturally similar to soils around it. These efforts may require an abundance of water for certain of its activities. If water is not readily available at the tops of the

slopes, a water buffalo may be acquired from state or National Guard motor pool for the duration of any segment of these efforts. This task includes excavating existing bituminous material, with filling and planting in these areas.

Areas requiring bituminous excavation and bank filling are small and total less than 100 linear feet of bank.

1. Removal of bituminous material must occur from the top of bank. Please note that the location and elevation of the toe of slope and top of bank cannot be changed.
2. Apply, rake the imported fill from the upland flat areas, distributing it (as much as possible) by hand labor. No work is to be done within two days of a storm. The slopes must remain stable after sculpting.
3. Soil to be used for stability should have not less than 20% fine textured material (passing the 200 sieve) and not more than 7% clay.
4. Excess surface and groundwater must be controlled. Within 2 days of a storm do no slope stabilization (grading, cutting, filling, mowing, trenching, etc.).
5. Retain where possible, existing trees, shrubs and other natural plants.
6. Scarify any fine-textured soils (at approximately right angles to the slope direction in soil areas with grade steeper than 3:1). For those >3:1 promptly fertilize, seed, mulch and otherwise stabilize.
7. Lightly compact soil around any seed area or planting to get good seed or root-soil contact.
8. Spread and staple seeded blanket cover (or seed and cover) following protocols established by the supplier [types, specifications and supplier recommendations to be chosen during construction].
9. Mulch in areas where there may be threat of plants drying out (also to prevent erosion).
10. Use netting and seed any bare soil within 2 weeks of original exposure.

Task 2. Retaining Wall Construction

Work includes furnishing and installing segmental retaining wall (SRW) units to the lines and grades designated on the project's final construction drawings or as directed by the Project Engineer, not to exceed 275 linear feet and 24 inches in height. Also included is furnishing and installing appurtenant materials required for construction of the retaining wall as shown on the construction drawings.

MATERIALS:

Retaining Blocks

SRW units shall be machine formed, Portland Cement concrete blocks specifically designed for retaining wall applications. SRW units currently approved for this project are:

1. UNILOCK Retaining Wall Units (Roman Pisa, color – vineyard blend)
2. VERSA-LOK Retaining Wall Units (comparable to Roman Pisa unit, provide current colors for Owner's review and selection)
 - Color of SRW units shall be as indicated above.
 - Finish of SRW units shall be split face.
 - SRW unit faces shall be of straight geometry.
 - SRW unit height shall be six inches.
 - SRW units (not including aggregate fill in unit voids) shall provide a

minimum weight of 105 psf wall face area.

- SRW units shall be solid through the full depth of the unit.
- SRW units shall have a depth (front face to rear) to height ratio of 2:1, minimum.
- SRW units shall be interlocked with connection pins, designed with proper setback to provide 8:1 vertical to horizontal batter (a 7 degree cant from vertical).
- SRW units shall be capable of being erected with the horizontal gap between adjacent units not exceeding 1/8 inches.
- SRW units shall be capable of providing overlap of units on each successive course so that walls meeting at corner are interlocked and continuous. SRW units that require corners to be mitered shall not be allowed.
- SRW units shall be capable of providing a split face, textured surface for all vertical surfaces that will be exposed after completion of wall, including any exposed sides and backs of units.
- SRW units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure. Cracking or excessive chipping may be grounds for rejection. Units showing cracks longer than 1/2" shall not be used within the wall. Units showing chips visible at a distance of 30 feet from the wall shall not be used within the wall.
- Concrete used to manufacture SRW units shall have a minimum 28 days compressive strength of 3,000 psi and a maximum moisture absorption rate, by weight, of 8% as determined in accordance with ASTM C1372. Compressive strength test specimens shall conform to the saw-cut coupon provisions of ASTM C140.
- SRW units' molded dimensions shall not differ more than $\pm 1/8$ inch from that specified, in accordance with ASTM C1372.

Material Submittals: The Contractor shall submit manufacturers' certifications two weeks prior to start of work stating that the SRW units and geosynthetic reinforcement meet the requirements of Section 2 of this specification.

Contractor shall check materials upon delivery to assure that specified type and grade of materials have been received and proper color and texture of SRW units have been received.

Contractor shall prevent excessive mud, wet concrete, epoxies, and like materials that may affix themselves, from coming in contact with materials.

Contractor shall store and handle materials in accordance with manufacturer's recommendations.

Contractor shall protect materials from damage. Damaged materials shall not be incorporated into the retaining wall.

SRW units shall be interlocked with manufacturer connection pins. The pins shall consist of glass-reinforced nylon made for the expressed use with the SRW units supplied.

Leveling Pad

Material for leveling pad shall consist of compacted sand, gravel, or combination thereof (USCS soil types GP, GW, SP, & SW) and shall be a minimum of 10 inches in depth. Lean concrete with a strength of 200-300 psi and three inches thick maximum may also be used as a leveling pad material.

The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit.

Reinforced (Infill) Soil

The reinforced soil material shall be free of debris. Unless otherwise noted on the final, P.E. sealed, retaining wall plans prepared by the Wall Design Engineer, the reinforced material shall consist of the inorganic USCS soil types GP, GW, SW, SP, SM, meeting the following gradation, as determined in accordance with ASTM D422:

<u>Sieve Size</u>	<u>Percent Passing</u>
4 inch	100
No. 4	20-100
No. 40	0-60
No. 200	0-35

The maximum particle size of poorly-graded gravels (GP) (no fines) should not exceed 3/4 inch unless expressly approved by the Wall Design Engineer and the long-term design strength (LTDS) of the geosynthetic is reduced to account for additional installation damage from particles larger than this maximum. The plasticity of the fine fraction shall be less than 20.

CONSTRUCTION:

The Owner or Owner's Representative is responsible for verifying that the Contractor meets all the requirements of the specification. This includes all submittals for materials and design, qualifications, and proper installation of wall system.

Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work at the site.

Excavation

Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer, at the Contractor's expense.

Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor

Foundation Preparation

Following the excavation, the foundation soil shall be examined by the Owner's Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Owner's Engineer.

Foundation soil shall be proofrolled and compacted to 95% standard Proctor density and inspected by the Owner's Engineer prior to placement of leveling pad materials.

Leveling Pad Construction

Leveling pad shall be placed as shown on the final, P.E. sealed retaining wall plans with a minimum thickness of 10 inches. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lower most SRW unit.

Granular leveling pad material shall be compacted to provide a firm, level bearing surface on which to place the first course of units. Well-graded sand (95% between 2 & 1/16 mm sieve) can be used to smooth the top 1/4 to 1/2 inch of the leveling pad. Compaction will be with mechanical plate compactors to achieve 95% of maximum standard Proctor density (ASTM D 698).

SRW Unit Installation

All SRW units shall be installed at the proper elevation and orientation as shown on the final, P.E. sealed wall plans and details or as directed by the Wall Design Engineer. The SRW units shall be installed in general accordance with the manufacturer's recommendations. The specifications and drawings shall govern in any conflict between the two requirements.

First course of SRW units shall be placed on the leveling pad. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad. The first course is the most important to ensure accurate and acceptable results. No gaps shall be left between the front of adjacent units. Alignment may be done by means of a string line or offset from base line to the back of the units.

All excess debris shall be cleaned from top of units and the next course of units installed on top of the units below.

Two connection pins shall be inserted through the pin holes of each upper course unit into receiving slots in lower course units. Pins shall be fully seated in the pin slot below. Units shall be pushed forward to remove any looseness in the unit-to-unit connection.

Prior to placement of next course, the level and alignment of the units shall be checked and corrected, where needed.

Layout of curves and corners shall be installed in accordance with the wall plan details or in general accordance with SRW manufacturer's installation guidelines. Walls meeting at corners shall be interlocked by overlapping successive courses.

Procedures C. through F. shall be repeated until reaching top of wall units, just below the height of the cap units. Geosynthetic reinforcement, drainage materials, and reinforced backfill shall be placed in sequence with unit installation as described in Section 4.06, 4.07, and 4.08.

Geosynthetic Reinforcement Placement

All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the final, P.E. sealed retaining wall plan profiles and details, or as directed by the Wall Design Engineer.

At the elevations shown on the final plans, (after the units, drainage material, and backfill have been

placed to this elevation) the geosynthetic reinforcement shall be laid horizontally on compacted infill and on top of the concrete SRW units, to within one inch of the front face of the unit below. Embedment of the geosynthetic in the SRW units shall be consistent with SRW manufacturer's recommendations. Correct orientation of the geosynthetic reinforcement shall be verified by the Contractor to be in accordance with the geosynthetic manufacturer's recommendations. The highest strength direction of the geosynthetic must be perpendicular to the wall face.

Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Splicing of the geosynthetic in the design strength direction (perpendicular to the wall face) shall not be permitted. Along the length of the wall, horizontally adjacent sections of geosynthetic reinforcement shall be butted in a manner to assure 100 percent coverage parallel to the wall face.

Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6 inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).

The geosynthetic reinforcement shall be free of wrinkles prior to placement of soil fill. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by six inches of fill.

Drainage Materials

Drainage aggregate shall be installed to the line, grades, and sections shown on the final P.E. sealed retaining wall plans. Drainage aggregate shall be placed to the minimum thickness shown on the construction plans between and behind units (a minimum of one cubic foot for each exposed square foot of wall face unless otherwise noted on the final wall plans).

Drainage collection pipes shall be installed to maintain gravity flow of water outside the reinforced soil zone. The drainage collection pipe shall daylight into a storm sewer or along a slope, at an elevation lower than the lowest point of the pipe within the aggregate drain.

Backfill Placement

The reinforced backfill shall be placed as shown in the final wall plans in the maximum compacted lift thickness of 10 inches and shall be compacted to a minimum of 95% of standard Proctor density (ASTM D 698) at a moisture content within 2% of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units.

Only hand-operated compaction equipment shall be allowed within 3 feet of the back of the wall units. Compaction within the 3 feet behind the wall units shall be achieved by at least three (3) passes of a lightweight mechanical tamper, plate, or roller.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing and reinforced backfill to direct water runoff away from the wall face.

At completion of wall construction, backfill shall be placed level with final top of wall elevation. If final grading, paving, landscaping, and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to

ensure water runoff is not directed at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

SRW Caps

SRW caps shall be properly aligned and glued to underlying units with a flexible, high-strength concrete adhesive. Rigid adhesive or mortar are not acceptable.

Caps shall overhang the top course of units by 3/4 to 1 inch. Slight variation in overhang is allowed to correct alignment at the top of the wall.

Construction Adjacent to Completed Wall

The Owner or Owner's Representative is responsible for ensuring that construction by others adjacent to the wall does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Heavy paving or grading equipment shall be kept a minimum of three feet behind the back of the wall face. Equipment with wheel loads in excess of 150 psf live load shall not be operated within 10 feet of the face of the retaining wall during construction adjacent to the wall. Care should be taken by the General Contractor to ensure water runoff is directed away from the wall structure until final grading and surface drainage collection systems are completed.

Task 3. Toe of Slope Revegetation

American Beachgrass (*Ammophila breviligulata*) will be used to stabilize the sandy riverine level base of slopes adjacent Camp Rowland. It is commercially available – as plants, not as seed. Beachgrasses shall be planted between October 1 and April 30. Its stems are called “culms” and are the planting stock. Two or three culms are planted per hole – ordinarily separated by 1½ feet (closer when wind erosion is severe). Planting is done in rows, staggered laterally for maximum erosion control. To prevent drying out, each culm must be planted at least 8 inches deep. A spade is excellent for opening the planting hole. Culms and roots must be kept moist before and during planting. In early stages (after planting) each plant should be inspected for signs of stress (drying).

Because beach sands are usually infertile, nutrients (properly applied) are the key to good growth. Soil will need to be fertilized prior to or during planting with 35 lbs. of inorganic Nitrogen per acre.

Protect the planted area from pedestrian and other traffic. Inspect and report after initial planting and during the following growing season. After each inspection provide copies of findings, maintenance requirements, fertilizers used (and amounts), destruction from pests, vermin, trespassers, etc.

Contractor will be required to replace and replant species lost during the first growing season.

Total area requiring toe of slope planting is less than 200 linear feet.

Task 4. Staircase Replacement

An existing staircase is to be removed and replaced in-kind with pressure-treated wood. The staircase is approximately 8 feet wide with

Period of Service:

Work under this scope will be initiated in October 2003 and completed by April 2005.